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REPORT OF THE FEDERAL HORTICULTURAL BOARD.

UNITED STATES DEPARTMENT OF AGRICULTURE,
FEDERAL HORTICULTURAL BOARD,
Washington, D. C., October 1, 1922.

SIR: I submit herewith an executive report covering the administration of the plant quarantine act for the fiscal year ended June 30, 1922.

Respectfully,

C. L. MARLATT,
Chairman of Board.

Hon. HENRY C. WALLACE,
Secretary of Agriculture.

FIELD COVERED.

The Federal plant quarantine act has for its object the prevention of entry into the United States of new and important insects or plant diseases injurious to agriculture, horticulture, and forestry, and the prevention of spread in the United States of any such pests which may have gained more or less limited foothold. In connection with the latter, the board is charged, either directly or in cooperation with the bureaus concerned, with the control and, if practicable, the eradication of such pests. To give such protection now involves the administration and enforcement of some 22 foreign and 15 domestic quarantines.

A brief record of the more important of the activities of the board is given in this report, including statistics of the importation of such controlled products as cotton, potatoes, fruits, nursery stock, etc. The detailed record of the work of the board, in relation to its various quarantine and other special subjects, is given permanent record in the Service and Regulatory Announcements published from time to time during the year.

CONTROL OF IMPORTANT NEW PLANT PESTS.

The Department of Agriculture is now attempting to prevent the spread and in some instances to eradicate a number of important introduced pests which still have a rather limited foothold. These include, among insect pests, the pink bollworm of cotton, the European corn borer, the gipsy and brown-tail moths, the Japanese beetle, and a number of minor enemies. Among plant diseases, similar control is being attempted in the case of the potato wart, white-pine blister rust, citrus canker, and certain diseases of small grains. The progress made in this work will be briefly summarized.

THE PINK BOLLWORM.**PRESENT STATUS.**

The work of eradicating the pink bollworm is in better status now than ever before, both from the standpoint of substantial reduction as to the infested areas and of suitable legislation and efficient cooperation on the part of the States and planters concerned.

As a result of interstate cotton conferences held in Washington and in Texas in 1921, fairly adequate State legislation has been obtained and good cooperation is being had with the States in this effort at eradication.

The real danger will come just at this period when the insect seems to be practically eliminated, and planters and others may come to the false conclusion that it is not necessary to continue the work and cost. The inspection and field work is more necessary and should be prosecuted with more intensity at this stage than at any other if ultimate success is to be gained.

Incidentally it may be said that this effort at eradication has resulted in the protection at a comparatively trivial cost of the cotton crop not only of the three States concerned but probably of the entire South, and, whatever the outcome of the effort, has been tremendously worth while from this standpoint alone.

As to Louisiana, no infestations by the pink bollworm were found in any of the old areas or elsewhere in the State in 1921, nor has there been any reappearance in that State determined so far this year (October 1, 1922). Louisiana may, therefore, be looked upon as possibly free from the pest.

In Texas, as to the older infestations in the eastern part of the State, but a single infested boll containing a single larva of the pink bollworm was found in the large Trinity Bay district in 1921. There has been no return of the pest in the Hearne district since the original clean-up in 1917, and this area may now be released as absolutely free from the pest. In the western areas of infestation in the Pecos Valley and in the Rio Grande Valley near El Paso, noncotton zones have never been established, and the pink bollworm reappeared very scatteringly in 1921, as was to have been expected. As long as the outcome in eastern Texas was uncertain, neither the planters nor the State authorities have been willing in these western areas to abandon the growth of cotton in an effort to completely eradicate the pest, but if it can be held to these western areas, which are separated by wide and uncultivated and fairly desert tracts from eastern cotton cultivation, they will present very little greater risk than occurs from the pink bollworm in Mexico.

The situation in New Mexico in the Rio Grande Valley and in the upper Pecos Valley is similar to that in western Texas.

The only new outbreaks by the pink bollworm during 1921 were two very incipient infestations in Ellis and Grayson Counties, in northern Texas, originating from shipments of seed from Carlsbad, N. Mex., made prior to the determination by the department of infestation at the latter point. These new outbreaks were immediately and vigorously taken hold of by the State and Federal authorities and thoroughly cleaned up and noncotton and surrounding regulated zones established for 1922. No infestation of the crop of 1922 near these points has so far developed. They present a sit-

uation no more serious than was Hearne in 1917, from which district the pink bollworm was completely eradicated with one year's clean-up.

Up to October 1, 1922, the only recurrences of the pink bollworm which have been determined have been in three fields on the Rio Grande in the Great Bend district. Necessarily in this area, with the possibilities of reinfestation from Mexico, the pink bollworm may be expected to occur in greater or less numbers any year. Fortunately, this area is a very unimportant cotton district and is isolated from other cotton regions.

SCOUTING WORK.

As a basis for the knowledge of the present status of this pest, very intensive inspection has been carried out during the present season in the States of Louisiana, New Mexico, Oklahoma, and Texas, involving a total of nearly 2,000 workdays. This inspection will continue throughout this year, and it is probable that additional points of infestation may be later determined.

The success or failure of the entire extermination project depends on the thoroughness and efficiency of such scouting and inspection work. In addition to the States listed which are directly concerned, this scouting has been extended to 12 other important cotton States, following up records of possibly infested material, and this work has been so thoroughly done that there is every reason to believe that the pink bollworm has not reached any of these States and that its known limits within the United States have been fairly accurately determined. An additional feature of this work is the scouting along the Mexican border in Mexico as a basis for border quarantine control.

CLEAN-UP WORK OF 1921.

In connection with the infestations found during the year 1921, clean-up operations were carried out as in former years. With respect to the new infestations in northern Texas, 802 acres were cleaned in Ellis County and 721 acres in Grayson County. In addition to the work done in northern Texas, the fields in practically the entire Trinity Bay area were cleaned. On account of the very rainy season the acreage in this district had been greatly reduced. The areas cleaned comprise 2,736 acres. The greater availability of labor in 1921 enabled the department to conduct this work very much cheaper or at almost half the cost of similar work in previous years under war conditions. In 1921 all the work in the Trinity Bay area was done by contract with farmers, whereas in previous years it had been necessary in many cases to obtain labor in the city and transport it and maintain it in the field. The total expenditure for clean-up work in 1921 was \$20,115.78 and involved altogether 4,259 acres, or a cost of approximately \$4.50 per acre.

FEDERAL PARTICIPATION IN COMPENSATION OF FARMERS.

The provision for participation with the States in compensation of farmers in noncotton zones given in the act of Congress approved August 9, 1921, has led to the disbursement to the State of Louisiana the sum of \$41,971.64 and to the State of Texas \$610 as to

the crop of 1921. The smaller sum for Texas is due to the fact that that State had already settled most of the claims of its farmers prior to the passage of the joint resolution of Congress. This participation by the Federal Government has been of tremendous service in stimulating cooperation on the part of both States and planters.

PROGRESS IN DISINFECTION OF COTTON SEED.

In Egypt one of the current methods of reducing the numbers of pink bollworms is to heat the seed in the process of ginning. It was found in preliminary experiments conducted in this country that the problem was quite different here on account of the insulation due to lint adhering to the seed, which is practically absent in the case of Egyptian seed. Experiments have been undertaken in Texas and Mexico in cooperation with the Texas Experiment Station and Department of Agriculture to determine the temperature to which seed could be heated without reducing its vitality, and suitable apparatus has been devised for such treatment. As a result of this work it has been determined that heating the seed to a temperature of 145° F. would destroy all infestation but would not lower the vitality of the seed. Such disinfection is now required under Texas law, in all districts regulated on account of the pink bollworm, and disinfecting machines have been provided in practically all gins in such districts. The crop of 1922 is being handled through these machines, which are interposed between the seed house and the gins, so that the disinfecting becomes an automatic part of the process of ginning.

RESEARCH WORK IN MEXICO.

The scientific and research phases of the subject have been conducted as hitherto in the Laguna district, Mexico, and very important information has there been obtained relative to the habits and control of the pest. This work is being conducted on a very small appropriation (\$5,000), but it is very desirable to considerably extend this work, and a fund of \$10,000 is requested for the year 1924. One important and very practical phase of this work is the determination that the pink bollworm can not as a rule survive in moist soil, and therefore the clean-up operations practiced by this department in Texas and other States—i. e., the destruction of all standing and scattered cotton and bolls—have undoubtedly had much of their success from the fact that any remaining larvæ and bolls have been those buried in moist soil. It has been shown that with infested bolls so buried from 95 to 99 per cent of the larvæ perish.

INVESTIGATIONS OF THE PINK BOLLWORM IN THE WEST INDIES.

The determination of the occurrence of the pink bollworm in the island of St. Croix, one of the Virgin Islands belonging to the United States, and also in the islands of St. Kitts and Montserrat in the West Indies, made it desirable, in view of the close commercial relations, interisland and with the United States, to have accurate information as to the extent of the foothold of this pest throughout the West Indies. For this purpose August Busck, entomological assistant of the board, spent several months in this investigation, which included the British and Dutch Guianas, Trinidad, and the islands northward,

including the Virgin Islands, and also Porto Rico, Santo Domingo, and Cuba.

The pink bollworm was determined as occurring from Montserrat north and west, including the British and Virgin Islands, and in Porto Rico and Santo Domingo. No infestation was found south of Montserrat. The fairly brief survey of Cuba did not result in the detection of this pest in that island. It was hoped that the pink bollworm would prove to be limited to a few of the smaller islands and that it would be practicable to recommend efforts at extermination—efforts, in fact, which the insular authorities, British and American, either had already undertaken or were willing to undertake. The determination, however, of the wide infestation of this pest in Porto Rico and of its having obtained a foothold in Santo Domingo, together with the cultural and vegetative conditions of these two larger islands and the abundance of wild cotton growing on them, made it, in the judgment of the experts of the department, inadvisable to recommend a general campaign of eradication. It was realized that unless it was possible to eradicate the pest from these larger islands it would be very difficult, if not impossible, to prevent repeated reinfestation of the smaller islands. Control in the smaller islands becomes, therefore, a local matter to be administered, if this is possible at a reasonable cost, by the islands concerned. These conclusions were the outcome of a general conference held on the subject by the board in Washington December 20, 1921.

The infestation in the West Indies apparently came from an importation of Egyptian cotton seed in 1911-12 into the island of St. Croix, then under Danish control, by the director of the island experiment station and the later distribution from this point of planting seed to other islands.

The existing quarantines on account of the pink bollworm now protect the United States from movement of cotton, cotton seed, etc., from the West Indies, including the American islands.

MEXICAN BORDER CONTROL.

The border control to prevent entry of the pink bollworm from Mexico is a continuing work. In connection with it the enforcement of various fruit and grain quarantines against Mexico is taken care of by the department's inspectors. During the fiscal year ended June 30, 1922, 35,747 freight cars were inspected in Mexican border towns for cotton seed, and of this number, 31,579 were fumigated immediately upon arrival in the American port of entry. At Del Rio, Tex., where there are at present no railroad connections, 31,861 vehicles of various descriptions were examined, 69 of which were fumigated on account of the presence of cotton seed at the time of inspection. Fumigation fees amounting to \$126,350.50 were collected and turned into the Treasury.

The amount of car fumigation and other work involved increased very greatly during the last fiscal year, due to the improved conditions in Mexico and the corresponding increase in freight and other traffic between Mexico and the United States. As a result it became necessary to call upon Congress for a supplemental appropriation, and \$50,000 was so appropriated in connection with the urgent deficiency act approved March 20, 1922. As noted, the moneys so expended

very largely are returned to the Treasury of the United States from the charges made for such car and other fumigation—charges based on the cost of chemicals and labor involved.

The inspection at the footbridges, in cooperation with the customs officials located at Brownsville, Laredo, Eagle Pass, and El Paso, Tex., as well as the boundary line at Nogales, Ariz., has been continued for the purpose of preventing the entry of cotton and cotton seed, as well as other plant products covered by quarantine. A total of 55,511 pieces of contraband material was intercepted as follows: Avocados, 13,422;¹ corn, 4,971; cotton, 1,797; grapefruit, 519; guavas, 2,842; limes, 2,106; mangoes, 1,550; oranges, 8,073; peaches, 8,037; plants, 5,601; plums, 882; potatoes, 951; sapotes, 142; sugar cane, 3,967; sweet potatoes, 651.

THE CORN BORER.

The administration of the corn-borer appropriation has been assigned to the Bureau of Entomology but in cooperation with this board as to quarantine features. There has been no new outbreak of the corn borer this year; in other words, this pest is still limited, so far as is known, substantially to the areas determined last year, these representing for the most part areas of original infestation from Europe in 1909 and 1910, namely, the New England area, the eastern and western New York areas, and the Ontario area, from which latter it has apparently spread, as determined last year, to the southern and western shores of Lake Erie. There has been during the year a local but limited natural spread of the insect in the case of each of these areas.

It would appear from this record that the quarantine and control measures safeguarding the movement of products from the known infested area have prevented wide jumps of the insect. The funds available for this work, however, have been entirely inadequate for general surveys of other States or areas and no positive claim is made that the department now has information as to the existing distribution of this pest in the United States.

It is very important that the corn-borer work should be continued. There is no question at all as to the importance of this pest of corn. It is a new pest and will be an additional burden on this crop. During the present year it has maintained itself about in the same status as previously in the known areas of infestation, there being certainly no increase of damage in the western areas of invasion in New York, Pennsylvania, Ohio, and Michigan, and, in point of fact, in these areas no material commercial damage has ever resulted. The extensive damage which the insect frequently occasions in the New England area seems to be explainable by the fact that the insect is there double-brooded and that the cultural and crop conditions are peculiarly favorable to its multiplication. The Canadian authorities report that the damage in Ontario this year is very much less than in either of the two previous years (1920 and 1921). This is supposed to be due to better cultural conditions and also to the late planting of corn.

¹ To permit the local consumption of the avocado fruit at ports on the border of Mexico, the board has authorized the entry of such fruit when stoned or seeded. The avocado weevils which the avocado quarantine is intended to exclude infest the seed and the removal of the seed practically eliminates any danger.

The menace of this pest to the main corn areas of the country is still to be determined. It may prove to be a very serious pest when it reaches the great Corn Belt and particularly when it gets into the more southern regions of corn culture. It can certainly always have a very serious phase in connection with table corn for immediate consumption or for canning, and in exceptional seasons with flint and possibly other corn, unless efficient control by natural enemies or other means develops.

There is every reason to continue and adequately support the quarantine work to prevent spread. The effort this year to divide the cost of this work between the States concerned and the Federal Government has been only partially successful. Fair support and cooperation has been obtained from certain States, and very inadequate from others. It becomes, therefore, a question to be seriously considered whether in a menace of this kind which affects the whole country protection should be jeopardized by conditioning the work on State support. In a State where the insect has never done any real damage, it is difficult to arouse interest and get prompt action, and the same is apt to be true in a State where the insect has already pretty well established itself and the benefit of the control is largely in the interest of other States. The neglect or failure of any State may negative both the efforts of other States and the Federal Government. The situation is analogous to the situation in Texas 30 years ago when the boll weevil first appeared, when it was neither possible to arouse the State legislature nor the farmers to take protective action, which at that time would have been a fairly easy and simple proceeding.

THE JAPANESE BEETLE.

The Japanese beetle quarantine fund is also being administered by the Bureau of Entomology, the board cooperating in quarantine features. It seems desirable here to emphasize the belief of the board that this pest is one of the most dangerous insect introductions made in many years, and threatens large future losses, particularly to fruit and forage crops; to the latter as a grub infesting the soil. This beetle seems to be still limited to the original area of infestation except for the natural spread of some 5 miles a year. In the center of this area, where the insect has become most abundant, the damage to foliage and fruit is very alarming. The ease with which the insect may be carried with produce is also a very disquieting feature; for example, during 1921, out of some 200,000 baskets of sweet corn moving out of the district and subject to inspection, upward of 5,000 beetles were removed. The insect may be carried by almost any of the farm, garden, florist, or nursery products moving out of the district, and in addition is a strong flier.

The quarantine and control work against a pest of this kind can be justified only by the repression of spread and lessening of damage secured. There is no question at all but that this pest will in time spread throughout the United States. The prevention of spread is of immediate value and gives a period during which the insect can be studied and its means of control more fully determined, and more particularly affords opportunity for the introduction from its original home of natural enemies. From this point of view the department

would seem fully justified in maintaining for the present the quarantine and other control of this pest which is now in operation.

THE GIPSY AND BROWN-TAIL MOTHS.

The quarantine control of the gipsy and brown-tail moths is in cooperation with the Bureau of Entomology. The quarantine on account of these two pests has been twice slightly modified during the year. The quarantined area has been extended with respect to the gipsy moth, but with respect to the brown-tail moth it has been possible to reduce very materially the area quarantined on account of this insect.

The new areas determined as infested in New Jersey, New York, and Pennsylvania in 1920-21 remain as formerly under the control of State quarantines, no Federal action having been taken, inasmuch as these State quarantines are being administered in active cooperation with the officers of the Bureau of Entomology of this department. The scattered points of invasion in Pennsylvania, New York, and New Jersey, which resulted from the big central colony at Somerville, N. J., have been apparently eradicated. The Somerville colony has been subjected to thorough clean-up and control work now for two seasons, and the outlook is good for the eradication of this pest in New Jersey.

Two new points of infestation were determined during the year on Long Island, and the clean-up of these areas is actively under way in cooperation with the State officials.

Inspection of products likely to disseminate the gipsy moth has been continued in New England and in New Jersey in cooperation with the State authorities, and shipments have been safeguarded by careful examination.

DATE SCALE ERADICATION.

There are approximately 20,000 imported date palms now planted in orchards in California, Arizona, and Texas. These special date districts include Coachella and Imperial Valleys in California, Yuma and Salt River Valleys in Arizona, and a small garden at Laredo, Tex. In addition to these planted orchards there are some 12,000 offshoots, recently imported from Algeria and Egypt, now being grown in 4 quarantine nurseries—2 in Indio, Calif., 1 in Yuma, Ariz., and 1 in Phoenix, Ariz. Altogether there are approximately 200 date plantations in the United States, of which 14 are still infested with the *Parlatoria* date scale. Several of these infested orchards have been almost completely cleaned up during the year, but others are still seriously infested, and among them are half a dozen orchards which contain large-sized palms which require repeated treatments over a considerable period to thoroughly eradicate the scale.

The 12,000 recently imported offshoots are all under close observation, and many of them are likely to develop scale infestation later on, even if they are now apparently clean, and these plantings must therefore be kept under observation for a considerable period of years before the plants can be taken out of quarantine and distributed.

More than 100 of the date plantations in the United States have been completely cleaned up within the past eight years by the methods now being followed, and it is believed that the remaining infested groves can be similarly cleaned up within the next few years.

The Parlatoria scale is so destructive to the date palm that the experts of the Bureau of Plant Industry and all others who have studied the matter agree that dates can not be grown in this country profitably unless the Parlatoria scale is completely eradicated. The whole future of this promising industry, which is so admirably adapted to the irrigated valleys of the Southwest, is therefore tied up with the success of the Parlatoria eradication work. Several million dollars have already been invested in date culture and the industry is a rapidly growing one.

During the past year a very efficient corps of date-scale inspectors has been trained, and rapid progress is being made in the work of eradication of the scale. The State and county officers of California and Arizona have given most thoroughgoing cooperation in this campaign of eradication.

THE PINE BLISTER RUST.

The Federal quarantines on account of this disease are being administered in cooperation with the Bureau of Plant Industry. The important development in the white pine blister rust situation was the discovery in the fall of 1921 of the establishment of this disease in southwestern British Columbia and in the Puget Sound region of Washington. The department, in cooperation with State and Canadian authorities, took prompt action to determine the extent of the infected area and to control or eradicate this new outbreak. The condition of the infected pines indicates that the disease must have been present in British Columbia as early as 1911. The infection is widely distributed on native western white pine and cultivated black currants in British Columbia, the most important location being at Revelstone, about 120 miles north of Idaho. This year cultivated black currants infected with the rust have been found in Washington in the counties of Whatcom, San Juan, Skagit, Island, Clallam, Pacific, and a single infected planted pine (*Pinus monticola*) was found at Blaine, Wash. In 1921 two small pines infected with blister rust were found in a nursery at Mount Vernon, Wash.

A Federal quarantine was established, coinciding with the Washington State quarantine and including the known infected area, to prevent the movement of five-leaved pines, currant and gooseberry plants out of that portion of Washington lying west of the summit of the Cascade Mountains.¹

As to the eastern areas of blister rust invasion, Federal Quarantine No. 26, which prohibits the movement of blister rust host plants from States east of and including Minnesota, Iowa, Missouri, Arkansas, and Louisiana interstate to points west of the quarantine line, has been continued to prevent the introduction and spread of the disease into uninfected regions. In the enforcement of this quarantine 70,180 shipments of nursery stock were examined for blister rust host plants during the past year. There were intercepted 135 shipments in violation of the quarantine, 93 per cent of which were

¹ Owing to a recent change in the Washington State blister rust quarantine, it has become necessary to extend the Federal quarantine to the entire State of Washington, instead of only that portion of the State west of the summit of the Cascades.

returned to the consignor and the remainder disposed of by consignee or State officials. The number of violations by nurserymen was reduced from 81 per cent in the spring of 1921 to 50 per cent in the spring of 1922. The increasing effectiveness of the quarantine is shown by this marked reduction in the number of violations by nurserymen. Practically all violations by nurserymen are found to result from neglect or carelessness on the part of nursery employees. This condition has been corrected through improved methods when brought to the attention of nurserymen. Violations by individuals not in the nursery business are invariably committed through lack of knowledge of quarantine regulations. In conducting quarantine inspection work the department has received excellent cooperation from the Post Office Department, common carriers, nurserymen, and State officials.

THE POTATO WART.

The European potato wart is still restricted in the United States to about 800 gardens situated entirely in mining villages in Pennsylvania, West Virginia, and Maryland. Nearly all standard American potato varieties have been tested for reaction to wart and many immune varieties have been determined, so that this disease does not now have the menace to this country which it originally had. In the invaded districts these immune varieties are now for the most part being grown under regulations enforced by the States concerned and the danger from these districts is thus being very greatly minimized.

A large volume of work has been accomplished in a study of this disease both from the technical standpoint of the disease itself and its control and also the determination of the reaction of varieties of potatoes to it as to immunity. It is proposed, after this year, to discontinue much of the research work which has hitherto been carried out by the board in cooperation with the Bureau of Plant Industry. An appropriation for the board for the next fiscal year has been asked for of only \$5,000 for cooperation in quarantine work and for some essential survey work. It is understood that the Bureau of Plant Industry will continue such technical research work in connection with the disease as may be necessary.

The board does not feel, however, that the time has come when it is either necessary or desirable to open the ports of the United States to the importation of foreign potatoes from countries known to be invaded by this disease. Such action would probably result in the extension of this disease to practically all the potato regions in the United States, and might very shortly involve a very serious consequence where the nonimmune rural-group varieties are the main dependence.

MISCELLANEOUS QUARANTINES.

The citrus canker and various diseases of small grains are subject to foreign quarantines promulgated by the board. The local or domestic control of these diseases is carried out by the Bureau of Plant Industry in cooperation with the board.

THE NURSERY STOCK, PLANT, AND SEED QUARANTINE.

CONFERENCE OF MAY 15, 1922.

Quarantine No. 37, regulating and conditioning the entry of foreign plants and seeds for propagation, has been in force for over three years, and while in its main features it has been recognized and accepted as necessary for the protection of the country from the entry of new pests, there have been objections to certain phases of the quarantine from time to time on the part of certain interests and individuals. To give opportunity for a full and free discussion of the whole subject of quarantine No. 37 a conference was called at Washington for May 15. This conference was largely attended, both by representatives of the various trade associations, the important horticultural and agricultural societies and associations, national and regional, and State horticultural, agricultural, and quarantine officials. There were also in attendance numerous individuals interested in the horticultural trades involved; also foreign delegates representing England, Holland, Belgium, and France.

It is believed that a better understanding of the need of safeguarding the country against the possible introduction of destructive pests and diseases has resulted from this conference, and also that it has cleared up a good many of the prejudices and mistaken ideas that existed concerning quarantine No. 37 and its operation.

At the conclusion of the conference provision was made by the department to take up certain special subjects which needed more intimate discussion at some time convenient to the department and the interests involved. Among the subjects to be thus considered are the questions of bulb importations and possibly orchids and certain classes of florist and nursery stock.

No plants or classes of plants are specifically excluded by quarantine No. 37. On the other hand, the quarantine makes provision for the entry of any plants for which a real horticultural or experimental need can be shown, and under it very large importations of what are often styled "prohibited plants" are being constantly made. (See records of importations of nursery stock plants and seeds, p. 17).

The records in the possession of the department fully demonstrate that any importation of any class of plants is attended with greater or less risk of bringing in new enemies in spite of all safeguards of inspection and disinfection. The protection which the country needs and demands therefore involves the exclusion of all stock not absolutely essential to the horticultural, floricultural, and forestry needs of the United States, and that is just what quarantine No. 37 attempts to do and must do if it is to be of any real service in excluding plant pests.

In this connection it is perhaps proper to point out that in connection with the importations which were permitted during the fiscal year 1922 there were intercepted upward of 500 different species of insect pests and also a considerable number of plant diseases. As a single example, in connection with importations in 1921 of fruit and rose seedlings from France, no less than 182 brown-tail moth nests were intercepted, distributed among some 41 different shipments. That this represents a growing carelessness on the part of the French exporter is indicated by the fact that in the nine preceding years only 63 such nests were found altogether. This alarming state of affairs

led to emphatic warnings being given to the French exporters and inspection authorities, with the result that so far this year there has been a very marked improvement, only two such nests having so far been taken. There was, however, a decided increase in pests of other kinds and many of them important pests new to this country.

CERTAIN MAIL ENTRY OF PLANTS NOW PERMITTED.

The importation by mail has hitherto been prohibited of plants and seeds for propagation, except field, vegetable, and flower seeds and importations made by or for the Department of Agriculture. Inasmuch as importations made by special permit under regulation 14, quarantine No. 37, are required to be addressed to the Federal Horticultural Board, United States Department of Agriculture, and are under complete control of the department until they are passed and distributed to ultimate destination, they can properly be considered as complying with the post-office order limiting mail importations of plants other than as indicated to those addressed to and intended for this department. By arrangement with the customs service and the Post Office Department, importation through the mails of special permit material is authorized when warranted by the nature and amount of the proposed shipment.

HORTICULTURIST ADDED TO BOARD'S STAFF.

In connection with all requests for special permits under regulation 14 for the importation of new varieties of plants and necessary propagating stock, the board has adopted the policy from the beginning of issuing such permits only on the recommendation and advice of the experts of the Bureau of Plant Industry as approved by the chief of that bureau. The burden of this work has been rather heavy, and as a means of facilitating the examinations and lessening the bureau's work, the board had added to its staff Prof. David Lumsden, a horticulturist of wide professional and practical experience.

There have been issued during the year a number of circulars giving explanation of the provisions for plant entry under quarantine No. 37. These have been distributed to all parties in interest.

RECORD OF ENTRY OF RESTRICTED PLANTS AND PLANT PRODUCTS.

Under various foreign quarantines the entry of certain plants and plant products is restricted and made subject to inspection, and, if necessary, disinfection as a condition of entry. These include cotton, cotton waste, cotton wrappings, and cottonseed products for the purpose of excluding the pink bollworm and other dangerous cotton pests; nursery stock, plants, and seeds for propagation for the purpose of excluding miscellaneous foreign pests—insect and disease; also potatoes from various foreign countries for the purpose of excluding potato diseases and insect pests; and various fruits and grains. The records of the importations of the more important of these subjects are indicated in the following discussion and tables:

COTTON, COTTON WASTE, COTTON BAGGING, AND COTTONSEED PRODUCTS IMPORTATIONS.

Except as noted below, disinfection is a condition of entry of all cotton, and entry is restricted to Boston, New York, San Francisco, and Seattle. Disinfection plants under private ownership and man-

agement, but under the supervision of Federal inspectors, are located at those ports.

Returned American cotton in original containers originating outside of the areas in New Mexico, Texas, and Louisiana quarantined on account of the pink bollworm, and cotton grown in the Imperial Valley, Lower California, Mexico, may enter without disinfection. The entry of unrestricted American cotton is permitted at all ports where the board maintains inspection service. Entry of cotton from the Imperial Valley is restricted to Calexico.

Cotton waste is classified as restricted and unrestricted. The former is waste which has not been manufactured or processed so as to have eliminated all seed. Disinfection of such waste is therefore a condition of entry, and entry is permitted at the ports of Boston, New York, San Francisco, and Seattle only. Unrestricted waste contains no seed and its entry is permitted at all ports where the board has inspectors, viz, at Philadelphia, Baltimore, New Orleans, and Portland, Oreg., in addition to the ports mentioned.

Bagging or other fabrics of the kinds ordinarily employed in wrapping cotton is also classified as restricted and unrestricted. Unrestricted bagging is (1) bagging which has not been previously used as cotton wrappers or containers and (2) American cotton bagging commonly known as coarse gunny which has been used to cover only cotton grown in the United States. Such material may enter at the following ports: Boston, New York, Philadelphia, Baltimore, Norfolk, Charleston, New Orleans, Portland, San Francisco, and Seattle. Under special arrangements with the collectors of customs at Detroit and Port Huron entry of unrestricted bagging not previously used as cotton wrappers is permitted at those ports. Material not falling under the classes enumerated is referred to as restricted. Permits for the entry of restricted bagging are issued for the ports of Boston, New York, Philadelphia, Baltimore, Portland, San Francisco, and Seattle. Disinfection is a condition of entry of restricted bagging. Disinfection may be accomplished at the disinfection plants above referred to or in process of manufacture approved by the board.

Cotton has been under restriction since 1915—seven years. The importations of cotton for this year (1921-22), 386,303 bales, exceed last year's imports by 165,000 bales and are the second largest made in any fiscal year since that date. They are exceeded by those made in 1919-20 only. (See tables below.) The totals of the importations during the last seven years are as follows:

Year.	Bales.	Year.	Bales.
1915-16...	316,260	1919-20.....	595,765
1916-17...	216,337	1920-21.....	221,303
1917-18...	195,723	1921-22.....	386,303
1918-19...	179,537		

It is interesting to note that the importations of Brazilian cotton in 1921-22 are more than double the largest previous imports from Brazil. The imports of Egyptian cotton are the third largest since the cotton records have been kept. The same is true of Haitian

cotton, while imports from India for the past year show the second largest importations from that country. Peru has entered 101,132 bales, the largest number recorded from Peru. The importations of returned American cotton exceed last year by approximately 8,000 bales, 16,405 bales having been entered. The majority of the returned American cotton has come from Germany.

The importations of waste show a decrease of about 14,000 bales in last year's importations. However, they fall short of the largest annual importation by about 19,000 bales only.

The importations of bagging, totaling 65,714 bales, bring this year's bagging imports to third place in size of annual importations of that commodity. They show a decrease from last year's importations of about 8,000. The largest importations of bagging were made in 1919-20, when 163,383 bales were entered. Such bagging was, however, an accumulation of that material gathered during the period of the war.

Cottonseed products, including cottonseed oil, are prohibited from Mexico except when they originate in mills in the Laguna district. Cottonseed products, except oil, from all foreign countries are under restriction. Cottonseed products entered during this year show a decrease from the importations of last year. The decrease is particularly noticeable in importations through the port of San Francisco and Eagle Pass.

During the year, 1,309 permits to import cotton, etc., were issued and 184 mills were licensed to use such cotton.

The accompanying tables indicate, respectively, the importations of cotton, cotton waste, bagging, cotton seed, seed cotton, and cottonseed products during the fiscal year.

Imports of ginned cotton, by country of origin and port of entry, 1921-22 (bales).

Country of origin.	Boston.	Calexico.	New Orleans.	New York.	Norfolk.	Philadelphia.	Port Huron.	Richford.	St. Albans.	San Francisco.	Savannah.	Seattle.	Total.
Brazil.....				11,366									11,366
British West Indies.....				1,335									1,335
China.....	3,300			11,321						500		541	15,662
Colombia.....				67									67
Dutch East Indies.....				930									930
Ecuador.....										1			1
Egypt.....	140,416			22,044									162,460
Haiti.....				8,872									8,872
India.....	5,806			7,216									13,022
Mexico.....		54,146											54,146
Peru.....	3,300			97,832									101,132
Porto Rico.....				764									764
Santo Domingo.....				134									134
Union of South Africa.....				7									7
United States.....	13,195		1,339	1,055	200	194	1	62	100	2	257		16,405
Total.....	166,017	54,146	1,339	162,943	200	194	1	62	100	503	257	541	386,303

Includes 9,731 bales unginned cotton from Imperial Valley, Lower California, Mexico.

Imports of cotton waste, by country of origin and port of entry, 1921-22 (bales).

Country of origin.	Boston.	Detroit.	New York.	Philadelphia.	Portland.	San Francisco.	Seattle.	Total.
Canada.....	3,125	25	81	61				3,292
China.....			3,606		202	105		3,913
England.....	303		1,041	1,242			5	2,591
France.....			301	87				388
Germany.....	92		1,873	97				2,062
Holland.....	9		179					188
India.....			3,003					3,003
Italy.....			2,614	87				2,701
Japan.....	200		2,461		65		1,240	3,966
Scotland.....			61					61
Spain.....	2							2
United States.....							251	251
Total.....	3,731	25	15,220	1,574	267	105	1,496	22,418

Imports of cotton bagging, by country of origin and port of entry, 1921-22 (bales).

Country of origin.	Baltimore.	Boston.	Charleston.	New Orleans.	New York.	Norfolk.	Philadelphia.	Port Huron.	Total.
Algeria.....					53				53
Belgium.....	3,896	1,090	1,488	2,753	2,887	338	773		13,225
Canada.....		515		3,087				873	4,475
Denmark.....					605				605
England.....	1,816	1,618		3,069	6,363	11,008			23,874
France.....	135		1,262	3,774	3,684				8,855
Germany.....		71	1,505	2,720	2,706	1,387	855		9,253
Holland.....	270	68	1,653		2,603	90	403		5,087
Scotland.....					287				287
Total.....	6,117	3,362	5,908	15,412	19,188	12,823	2,031	873	65,714

Imports of cotton seed, seed cotton, and cottonseed products, 1921-22 (tons).

Port of entry.	Seed cotton.	Cotton seed.	Cotton-seed cake.	Cotton-seed meal.
Boston.....			985	6
Calxico.....	7,299	25,351		
Eagle Pass.....			1,320	
Laredo.....			355	
New York.....				440
San Francisco.....			1	
Total.....	17,299	25,351	2,661	446

¹ Shown in cotton tables as 9,731 bales of unginned cotton.

IMPORTATIONS OF NURSERY STOCK, PLANTS, AND SEEDS.

Under regulation 3 of quarantine No. 37, certain important classes of plants are open to unlimited importation under continuing permits, upward of 5,000 of which have already been issued. The three tables following give a record of the importations under this regulation during the fiscal year 1922, representing respectively the importations of fruit, rose, and nut stocks; bulbs and tree seeds. Under regulation 2 of the quarantine, field, vegetable, and flower seeds, as well as all fruits, vegetables, cereals, and other plant products imported for medicinal, food, or manufacturing purposes, are free from all restrictions, even the taking out of a permit, and hence no records of the importations of these classes of seeds and plant products are collected by the board.

Importation of fruit, rose, and nut stocks (figures indicate number of plants).

Kind of stocks.	Country of origin.									Total.	
	Belgium.	Cuba.	England.	France.	Holland.	Ireland.	Italy.	Luxembourg.	Norway.		Scotland.
Fruit:											
Apple.....			150	3,983,150	298,650		290,300				4,572,250
Cherry.....				8,014,500	671,000						8,685,500
Grape.....			12	65,310							65,322
Pear.....				2,627,041	68,500		117,400				2,812,941
Pineapple...		174,600									174,600
Plum.....				2,460,700	81,000		487,500		50		3,029,250
Quince.....				921,300	30,525		11,150				962,975
Not specified.				7,000							7,000
Rose.....	2,050		1,871,600	2,432,040	2,325,933	100,000		500		40,000	6,772,123
Nut:											
Chestnut...				6,000							6,000
Walnut.....				14,000							14,000
Not specified.				12,400							12,400
Total number of stocks..	2,050	174,600	1,871,762	20,543,441	3,475,608	100,000	906,350	500	50	40,000	27,114,361

Importation of bulbs (figures indicate number of bulbs).

Country of origin.	Crocus.	Hyacinth.	Lily.	Lily of the valley.	Narcissus.	Tulip.	Unclassified.	Total.
Azores.....			19,000					19,000
Bermuda.....		6	179,030		250			179,286
China.....			2,520		1,000,515			1,003,035
England.....		75	7,806		325,610	5,533		339,024
France.....		1,070,210	616,957		40,552,251	71,690		42,311,108
Germany.....				2,628,700		50		12,628,750
Holland.....	6,319,082	23,730,195	159,678	2,322,470	35,014,752	64,769,667	70,750	132,386,594
Italy.....		7,750	2,524		375,250			385,524
Japan.....			7,231,945		1,920			7,233,865
Total..	6,319,082	24,808,236	8,219,460	14,951,170	77,270,548	64,846,940	70,750	196,486,186

Importation of tree seeds (figures indicate number of pounds).

Country of origin.	Apple.	Cherry.	Nuts and palm.	Ornamental and tree.	Pear.	Per-sim-mon.	Plum.	Quince.	Rose.	Total.
Australia.....			57,801	124						57,925
Austria.....		1,550		3,073			200		100	4,923
Brazil.....			1,276							1,276
British Guiana.....			304							304
Canada.....				120						120
Ceylon.....			75							75
Chile.....			5							5
Cuba.....			105							105
China.....			294	278	72		100			744
England.....			380							380
France.....	30,252	3,337	44	5,749	479		4,569	8	53	44,491
Germany.....		110	166	2,893	5		110			3,284
Holland.....				80						80
Honduras.....			130							130
Italy.....		100					309			409
Japan.....		4	2,102	5,535	2,907	143	308		760	11,759
Poland.....				983						983
Siam.....			375							375
Spain.....				304						304
Sweden.....				25						25
West Indies.....			1,100							1,100
Total.....	30,252	5,101	64,177	19,164	3,463	143	5,596	8	913	128,817

The distribution within the United States of the classes of nursery stock recorded in the above tables is indicated in the following table. This table is interesting and fairly important as indicating the wide distribution of such imported plants and seeds. Under the provisions of the quarantine, the classes of plants and seeds open to unlimited introductions go from port of entry directly to the State and

place of destination, and the detailed inspection of these shipments is, under the provisions of the quarantine and of the plant quarantine act, carried out by State authority. The responsibility, therefore, for the ultimate passing of this material and the safeguarding of it from plant enemies rests with the States concerned. Where possible, a mere preliminary inspection is made at the port of entry by department inspectors to determine compliance of the shipment as a whole with the conditions of entry as to kind of stock, certification, freedom from earth, etc. A percentage inspection is, however, made of most bulb importations, more particularly for the reason that State inspectors as a rule are enabled to follow up the distributions of such bulbs to the numerous destination points.

Distribution, by States, of nursery stock and seeds imported under regular permit (figures indicate number of cases unless otherwise designated).

State.	Bulbs.	Fruit stocks.	Rose stocks.	Nut stocks.	Seeds (by pounds).				
					Fruit.	Nut and palm.	Orna- mental and tree.	Rose.	Total.
Alabama.....	378	33	2	.....	23	452	28	.....	503
Alaska.....	4	.....	.....	.....	.....	.....	.....	.....	.....
Arizona.....	17	.....	.....	1	.....	.....	.....	.....	.....
Arkansas.....	100	7	1	.....	.....	.....	.....	.....	.....
California.....	3,754	28	.....	.....	337	12,801	1,154	50	14,342
Colorado.....	826	.....	81	.....	.....	84	13	38	135
Connecticut.....	2,031	74	8	.....	9	1,266	51	.....	1,326
Delaware.....	288	.....	.....	.....	.....	.....	.....	.....	.....
District of Columbia.....	518	.....	1	.....	45	.....	38	.....	83
Florida.....	70	14	.....	.....	.....	4,291	172	.....	4,463
Georgia.....	1,215	.....	.....	.....	.....	210	1,600	.....	1,810
Idaho.....	28	.....	.....	.....	.....	.....	.....	.....	.....
Illinois.....	28,254	16	61	.....	100	3,964	3,430	.....	7,494
Indiana.....	1,299	31	77	.....	.....	75	.....	.....	75
Iowa.....	1,087	122	15	.....	10,675	.....	844	.....	11,519
Kansas.....	518	20	.....	.....	19,739	84	76	.....	19,899
Kentucky.....	799	1	.....	.....	.....	.....	.....	.....	.....
Louisiana.....	288	.....	.....	.....	.....	188	.....	.....	188
Maine.....	515	.....	.....	.....	.....	.....	.....	.....	.....
Maryland.....	897	21	3	.....	3	300	.....	95	395
Massachusetts.....	6,467	2	9	.....	3	942	499	.....	1,444
Michigan.....	3,248	106	13	.....	32	90	31	.....	153
Minnesota.....	1,732	.....	3	.....	1	90	1	.....	92
Mississippi.....	118	.....	.....	.....	1	82	2	.....	85
Missouri.....	1,828	32	1	.....	2,365	234	43	.....	2,642
Montana.....	189	.....	1	.....	.....	75	.....	.....	75
Nebraska.....	492	.....	.....	.....	10	158	1,000	.....	1,168
Nevada.....	2	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire.....	354	.....	.....	.....	.....	.....	310	.....	310
New Jersey.....	6,155	8	159	.....	43	15,538	639	302	16,522
New Mexico.....	12	.....	.....	.....	.....	.....	.....	.....	.....
New York.....	39,083	565	230	7	4,362	8,344	608	315	13,629
North Carolina.....	451	20	1	.....	.....	168	265	.....	433
North Dakota.....	61	.....	.....	.....	.....	.....	.....	.....	.....
Ohio.....	6,915	89	116	2	4	1,301	272	.....	1,577
Oklahoma.....	290	3	.....	.....	345	.....	.....	.....	345
Oregon.....	971	.....	2	.....	735	87	200	.....	1,022
Pennsylvania.....	19,690	72	28	1	4,992	11,231	7,254	13	23,490
Rhode Island.....	1,065	.....	3	.....	.....	8	.....	.....	8
South Carolina.....	283	.....	.....	.....	.....	.....	2	.....	2
South Dakota.....	74	4	.....	.....	.....	.....	10	.....	10
Tennessee.....	1,098	15	1	.....	.....	420	300	.....	820
Texas.....	1,100	3	.....	.....	.....	218	21	.....	239
Utah.....	223	2	.....	.....	.....	.....	.....	.....	.....
Vermont.....	273	.....	.....	.....	.....	.....	200	.....	200
Virginia.....	1,535	1	2	.....	.....	318	.....	.....	318
Washington.....	1,184	7	.....	.....	734	84	50	.....	868
West Virginia.....	406	.....	.....	.....	3	.....	1	.....	4
Wisconsin.....	2,601	1	4	.....	5	84	50	.....	139
Wyoming.....	8	.....	.....	.....	.....	.....	.....	.....	.....
Exported by permittees.....	350	.....	1	.....	.....	990	.....	.....	990
Total.....	141,113	1,297	823	11	44,563	64,177	19,164	913	128,817

The record of entry under special permits of restricted plants under regulation 14 for the purpose of keeping the country supplied with new varieties and necessary propagating stock and to meet any other technical or research need is given in the following table. During the fiscal year 1922, 750 such special permits were issued, covering the entry of 9,573,199 plants and bulbs. Importations have already been made under 518 of these special permits of 3,344,026 plants and bulbs. In addition to the record for 1922, data for the three years during which the quarantine has been in effect are included. It will be noted that during the three years a total of 11,344 varieties of plants has been under consideration, of which 10,115, or 89.1 per cent, have been approved for entry. The discrepancy between the numbers of plants authorized and the numbers imported is due largely to the fact that the permittees have not been able to secure abroad the quantities of plants which they have been authorized to import. In many instances such permits were reissued the year following. In this connection it should be remembered that these special permits are issued for new varieties and stock unavailable in the United States and the permittees asked for all they hoped to get, but very naturally such material is often limited as to quantity in the country of origin. A considerable percentage of the permits issued during the last fiscal year have been renewed for the present year where the importer was unable to secure his material and make his importations under the original permit. All special permits, except for orchids, are terminated at the end of the fiscal year (June 30) and reissued if necessary. In the case of orchid permits, these are valid through the calendar year.

Special permit importations, fiscal year 1922, with combined totals for 1920, 1921, and 1922.

Name.	Fiscal year 1922.				Grand totals, 1920, 1921, and 1922.			
	Permits issued.		Permits imported.		Permits issued.		Permits imported.	
	Num-ber.	Quantity.	Num-ber.	Quantity.	Num-ber.	Quantity.	Num-ber.	Quantity.
Gladioli.....	95	2,611,259	62	1,262,391	352	18,178,247	243	7,657,605
Dahlias.....	62	3,209	47	1,880	143	11,209	104	6,516
Iris.....	189	2,573,248	108	605,881	321	9,232,115	189	4,787,642
Peonies.....	103	383,135	80	56,294	202	540,540	128	96,570
Other bulbs, rhizomes, and roots.....	91	2,327,405	47	684,869	185	3,753,491	102	1,299,641
Ornamentals.....	99	544,747	72	487,851	215	1,161,266	123	679,475
Roses.....	84	13,041	55	7,973	165	57,674	109	44,894
Orchids.....	50	8,194	44	7,013	142	40,172	109	18,108
Herb plants.....	112	1,106,414	53	229,718	185	1,312,868	92	370,122
Fruits.....	9	2,547	4	156	21	3,474	7	282
Total.....	.....	9,573,199	.....	3,344,026	.....	34,291,056	.....	14,960,855

Summary for the years 1920, 1921, and 1922.

Fiscal year.	Permits issued.		Permits imported.	
	Number.	Quantity.	Number.	Quantity.
1920.....	311	10,752,844	171	3,484,195
1921.....	622	13,965,013	411	8,132,634
1922.....	750	9,573,199	518	3,344,026
Grand total.....	1,683	34,291,056	1,100	14,960,855

IMPORTATIONS OF OTHER RESTRICTED PLANT PRODUCTS.

In addition to the foregoing record of importations of plants and plant products for propagation, the board has supervised the importation under quarantine of 11,951 sacks of potatoes, chiefly from Denmark and Mexico; 40,682 boxes of oranges, chiefly from Japan; 26,067 barrels of horseradish to insure freedom from earth; 1,741 bales of brooms and 6,696 bales of broom corn, both of which latter have been sterilized with steam. The board has also supervised and safeguarded the importation for immediate exportation in bond to other countries of considerable quantities of prohibited or restricted plants and plant products.

The enforcement of quarantine No. 49, on account of the black fly, has brought under restriction and regulation practically all fruit and vegetable importations from Cuba, the Bahamas, Jamaica, Canal Zone, Costa Rica, India, Philippine Islands, Ceylon, and Java. The records of importations for the year are given in the following tables:

Fruits and vegetables imported under quarantine No. 49 during fiscal year ending June 30, 1922, by countries of origin.

Kind.	Bahamas.	Canal Zone.	Costa Rica.	Cuba.	Jamaica.	Total.
Avocados.....crates.....	10	.....	.....	46,614	12	46,636
Bananas.....bunches.....	152	331,256	3,692,507	1,983,307	10,647,059	16,654,281
Cassava.....crates.....	.....	.....	.....	605	.....	605
Cocanuts.....number.....	25,790	15,740,326	34,110	1,660,734	16,315,276	33,776,236
Eggplants.....crates.....	.....	.....	.....	52,856	.....	52,856
Figs.....do.....	.....	.....	.....	.....	592	592
Grapefruits.....do.....	70	.....	126	184,027	2,758	186,981
Lima beans.....do.....	.....	.....	.....	6,885	.....	6,885
Limes.....do.....	.....	.....	311	549	84	944
Malangas.....do.....	.....	.....	1,022	.....	1	1,023
Mammeas.....do.....	4	.....	.....	1,963	.....	1,967
Mangoes.....do.....	.....	.....	.....	5,528	511	6,039
Okra.....do.....	.....	.....	.....	6,133	1	6,134
Onions.....do.....	.....	.....	.....	4,000	2	4,002
Oranges.....do.....	.....	2	1,132	4,989	3,206	9,329
Peppers.....do.....	7	.....	23	108,241	6,155	114,426
Pineapples.....do.....	3,513	.....	11,340	1,051,051	14	1,065,918
Plantains.....do.....	2	8,975	391	65,764	149	75,281
Potatoes.....sacks.....	.....	.....	.....	300	.....	300
Pumpkins.....number.....	165	.....	.....	267	20	452
Sapodillas.....crates.....	783	.....	.....	28	.....	811
Squash.....do.....	2	.....	.....	925	.....	927
Tomatoes.....do.....	103,287	.....	.....	97,565	.....	200,852
Watermelons.....number.....	30	.....	.....	6	.....	36
Not specified.....crates.....	.....	100	.....	823	1	924
Miscellaneous:						
Fruits.....do.....	7	.....	4	645	.....	656
Vegetables.....do.....	37	27	.....	245	7	316

Fruits and vegetables imported under quarantine No. 49 during fiscal year ending June 30, 1922, by ports of entry.

Kind.	Balti- more, Md.	Boston, Mass.	Key West, Fla.	Miami, Fla.	New Or- leans, La.	New York, N. Y.	Phila- delphia, Pa.	Tam- pa, Fla.	Total.
Avocados.....crates.....		5	17,881	10	13,602	7,468	2	7,668	46,636
Bananas.....bunches.....	2,880,450	1,705,101	3,148	42,924	868,963	8,377,568	2,758,958	17,169	16,654,281
Cassava.....crates.....			505			60		40	605
Coconuts.....number.....	1,117,900	108,300	1,264	37,790	263,200	39,360,282	1,872,500	15,000	33,776,236
Eggplants.....crates.....			2		4,401	48,453			52,856
Figs.....do.....			2			590			592
Grapefruit.....do.....	333	344	61,710		7,485	117,105	4		186,981
Lima beans.....do.....						6,885			6,885
Limes.....do.....			17		230	636		38	944
Malangas.....do.....			388			335		300	1,023
Mammeas.....do.....			420	4	272			1,271	1,967
Mangoes.....do.....			50		4,911	1,077	1		6,039
Okra.....do.....			176		2,647	3,158		153	6,134
Onions.....do.....						3,902		100	4,002
Oranges.....do.....	1,471	295	4,555			2,985		20	9,329
Peppers.....do.....			605	7	2,258	111,427		129	114,426
Pineapples.....do.....		2,773	808,631	1,679	18,456	232,083		2,266	1,065,918
Plantains.....do.....		503	20,445	9,702		36,085	1	8,545	75,281
Potatoes.....sacks.....			300						300
Pumpkins.....number.....			153	165		36			452
Sapodillas.....crates.....			7	783					811
Squash.....do.....				2	7	918			927
Tomatoes.....do.....			22,976	36,206	39,318	102,117		235	200,852
Watermelons.....number.....			6	30					36
Not specified.....crates.....			1			922	1		924
Miscellaneous:									
Fruits.....do.....		4	307	7	53	95		190	656
Vegetables.....do.....		27	100	37	17	132		3	316

PORT-INSPECTION SERVICE.

This service is the first line of defense and represents a very important and rapidly growing activity. The enforcement of foreign quarantines must primarily be carried out at the ports of entry of the United States. It involves the inspection, in cooperation with customs officers, of vessels arriving from foreign countries for the purpose of excluding plant pests with plant material brought as cargo of such vessels or by passengers or crews. In the case of Mexico, it involves the control of freight and other traffic between that Republic and the United States, and control to a much less extent on the Canadian border.

Two States, California and Florida, on account of their very important fruit interests, are giving most valuable cooperation and aid in such port-inspection work. The State of California is spending in this work approximately \$100,000 a year to protect her great fruit industry, and by collaboration this department gets the advantage of this work at trifling cost. Florida is in a similar status. No other States are taking this kind of action, and the protection at the other ports of the United States is practically limited to work of the Federal Horticultural Board.

The importance of this work may be illustrated by the following typical instance: The examination of the personal baggage of a passenger landing at Baltimore from Brazil disclosed in one of his boxes some fifty-odd packages of Brazilian cotton seed all infested with living pink bollworms. The owner proposed to take the material to the cotton section of Mississippi for planting. Had there been no inspector at Baltimore, this entry would probably have

resulted in the establishment in Mississippi and in the South of the worst known enemy of cotton, and would possibly have nullified all the effort which has been going on now for several years at great cost to control and eradicate this pest in its present rather limited foothold in Louisiana, Texas, and New Mexico. This is only one illustration of hundreds during the year of the interception of pests threatening many of the major fruit and field crops of the Nation. These interceptions have included such important pests as the corn borer, citrus canker, pink bollworm, various fruit flies (including the Mediterranean), potato weevils, and many others of both known and unknown possibilities. A total of 397 different kinds of insect pests have been thus intercepted and identified, together with 175 others the specific identification of which it has not been possible to make. A complete list of the insects intercepted on foreign plants and plant products during 1921 is given in the annual letter of information on such interceptions published for that year.

In connection with this inspection of imported plants and plant products it is very important that provision be made for cooperation with the Post Office Department for the examination of parcel-post packages from abroad. The postal inspectors are not trained to make such inspections, and such parcels very frequently have been found to contain the very pests which the department is making a valiant effort to exclude from this country or exterminate, and inasmuch as such parcels may go directly to the interior points for customs examination and distribution they present an exceptional menace. There are some 25 border and interior points for the examination of such parcel-post packages in the United States. The board now has inspectors, in connection with other port duties, at only 11 of these points.

Outside of the collaborative service in California and Florida referred to above, the port inspection service as now being conducted covers particularly the ports of Baltimore, Boston, New Orleans, Philadelphia, Portland, and Seattle, and involves the inspection of the ocean commerce entering these ports.

This service is very inadequate and undermanned at all of the ports listed and long hours of duty are involved, and even then only partial inspection can be made and other important ports are without any protection of this sort whatsoever.

To enable the board to adequately extend and properly conduct this service and to cooperate with the Postal Service at points where no department inspectors are now stationed, the board requested an increase of \$100,000. This sum was looked upon as a minimum, but was reduced to \$60,000 on the score of economy. Protection of this sort is work of a continuing nature and must be carried out efficiently and adequately, and is, therefore, on a different basis from work which may be postponed or materially reduced to be resumed later. In other words, a single introduction such as the specific example given above would cost the country hundreds of millions of dollars. The likelihood of such introductions can be largely eliminated if adequate inspection is made possible.

An additional very important feature of the inspection service of the board is the inspection at the quarantine house of the department of plant materials imported from all quarters of the world under special permits, and also the importations of new plants and seeds made by

the department. In connection with this work a total of 12,732 shipments of plants and plant products were examined by the local inspection service of the board. Of this number 426 represented special plant introduction importations under the provision of quarantine No. 37. The others represented departmental importations or inspection and certification of plants and plant products of domestic origin arriving in or leaving the District of Columbia.

TERMINAL INSPECTION OF MAIL SHIPMENTS OF PLANTS AND PLANT PRODUCTS.

During the year Utah instituted terminal inspection of mail shipments of plants and plant products authorized by the act of March 4, 1915, and the terminal inspection stations in California and Mississippi were revised. California, Arizona, Montana, Florida, Washington, Arkansas, the District of Columbia, Mississippi, and the Territory of Hawaii had previously, in the order named, taken advantage of the provisions of the act referred to. Such terminal inspection is conducted entirely at the expense of the States concerned and has proved to be an important adjunct to the efforts of this board in enforcing its domestic quarantines.

CONVICTIONS FOR VIOLATIONS OF THE PLANT QUARANTINE ACT.

During the past year the solicitor of the department reported the conviction of 19 shippers for violations of the plant quarantine act, 14 in regard to the white pine blister rust quarantine, 2 in regard to the avocado or alligator pear quarantine, 1 in regard to the sweet potato and yam quarantine, 1 in regard to the gipsy moth and brown-tail moth quarantine, and 1 in regard to the sugar-cane quarantine (foreign). Fines aggregating \$437 and costs were imposed.

NEW AND REVISED PLANT QUARANTINES.

The following quarantines and other restrictive orders were either promulgated or revised since July 1, 1921, to the date of the preparation of this report, October 1, 1922:

Domestic quarantines.—Quarantine No. 51, restricting the movement from the United States into Hawaii of sugar cane, corn, cotton, alfalfa, and fruits of avocado and papaya, promulgated July 22, 1921; the pink bollworm quarantine, revised August 19, 1921, amended October 24, 1921, and again revised March 31, 1922; the European corn borer quarantine (domestic), revised October 29, 1921, and April 7, 1922, amended July 28, 1922, and September 2, 1922; the European corn borer quarantine (foreign), revised July 8, 1921; the gipsy moth and brown-tail moth quarantine, amended December 23, 1921, and June 15, 1922; the Japanese beetle quarantine, revised November 28, 1921; the satin moth quarantine, promulgated December 28, 1921; and the white pine blister rust quarantine (covering the State of Washington), promulgated March 1, 1922.

Other restrictive orders.—Regulations governing the importation of potatoes into the United States, revised February 28, 1922, and amended June 19, 1922.

A complete list of the current domestic and foreign quarantines and other restrictive orders follows:

LIST OF CURRENT QUARANTINE AND OTHER RESTRICTIVE ORDERS.

QUARANTINE ORDERS.

The numbers assigned to these quarantines indicate merely the chronological order of issuance of both domestic and foreign quarantines in one numerical series. The quarantine numbers missing in this list are quarantines which have either been superseded or revoked. For convenience of reference these quarantines are here classified as domestic and foreign.

DOMESTIC QUARANTINES.

Date palms.—Quarantine No. 6: Regulates the interstate movement of date palms or date-palm offshoots from Riverside County, Calif., east of the San Bernardino meridian; Imperial County, Calif.; Yuma, Maricopa, and Pinal Counties, Ariz.; and Webb County, Tex.; on account of the *Parlatoria* scale (*Parlatoria blanchardi*) and the *Phoenicococcus* scale (*Phoenicococcus marlatti*).

Hawaiian fruits.—Quarantine No. 13, revised: Prohibits or regulates the importations from Hawaii of all fruits or vegetables, in the natural or raw state, on account of the Mediterranean fruit fly and the melon fly.

Sugar cane.—Quarantine No. 16: Prohibits the importation from Hawaii and Porto Rico of living canes of sugar cane, or cuttings or parts thereof, on account of certain injurious insects and fungous diseases.

Five-leaved pines, Ribes and Grossularia.—Quarantine No. 26, as amended: Prohibits the interstate movement of five-leaved pines, currant and gooseberry plants from all States east of and including the States of Minnesota, Iowa, Missouri, Arkansas, and Louisiana to points outside of this area; prohibits further (1) the interstate movement of five-leaved pines and black-currant plants to points outside the area comprising the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, and New York, and, (2) to protect the State of New York, the movement from the New England States, on account of the white-pine blister rust.

Sweet potato and yam.—Quarantine No. 30: Prohibits the movement from the Territories of Hawaii and Porto Rico into or through any other Territory, State, or District of the United States of all varieties of sweet potatoes and yams (*Ipomoea batatas* and *Dioscorea* spp.), regardless of the use for which the same are intended, on account of the sweet-potato weevil (*Cylas formicarius*) and the sweet-potato scarabee (*Euscepes batatae*).

Banana plants.—Quarantine No. 32: Prohibits the movement from the Territories of Hawaii and Porto Rico into or through any other Territory, State, or District of the United States of any species or variety of banana plants (*Musa* spp.), regardless of the use for which the same are intended, on account of two injurious weevils, (*Rhabdocnemis obscurus*) and (*Metamasius hemipterus*).

Black stem rust.—Quarantine No. 38: Prohibits the movement interstate to any point outside of the quarantined area of the common barberry and its horticultural varieties, as well as certain other species of Berberis and Mahonia, on account of the black stem rust of wheat, oats, barley, rye, and many wild and cultivated grasses.

European corn borer.—Quarantine No. 43 (second revision): Regulates the movement interstate to any point outside of the quarantined area of (1) corn and broom corn (including all parts of the stalk), all sorghums, sudan grass, celery, green beans in the pod, beets with tops, spinach, rhubarb, oat and rye straw as such or when used as packing, cut flowers or entire plants of chrysanthemum, aster, cosmos, zinnia, hollyhock, and cut flowers or entire plants of gladiolus and dahlia, except the bulbs thereof, without stems, from infested areas in Massachusetts and New Hampshire, and (2) corn and broom corn (including all parts of the stalk), all sorghums, and sudan grass from infested areas in New York, Pennsylvania, Ohio, and Michigan on account of the European corn borer (*Pyrausta nubilalis*).

Gipsy moth and brown-tail moth.—Quarantine No. 45, as amended: Regulates the movement interstate to any point outside of the quarantined towns and territory, or from points in the generally infested area to points in the lightly infested area, of stone or quarry products, and of the plants and the plant products listed therein. The quarantine covers all the New England States.

Hawaiian and Porto Rican cotton, cotton seed, and cottonseed products.—Quarantine No. 47: Regulates the movement of cotton, cotton seed, and cottonseed products from Hawaii and Porto Rico on account of the pink bollworm and the cotton blister mite, respectively.

Japanese beetle.—Quarantine No. 48, revised: Regulates the movement interstate to any point outside of certain portions of the counties of Burlington, Gloucester, and

Camden, N. J., and certain portions of the counties of Philadelphia, Montgomery, and Bucks, Pa., of the following articles from the heavily infested area: (1) Sweet, green, or sugar corn, grapes, lettuce, cabbage, and forage crops of all kinds, including hay and straw; (2) nursery, ornamental, and greenhouse stock, and all other plants, except bulbs and cut flowers; and (3) soil, compost, and manure other than fresh manure; and from the lightly infested area, (1) nursery, ornamental, and greenhouse stock and all other plants except bulbs and cut flowers; and (2) soil, compost, and manure other than fresh manure, on account of the Japanese beetle (*Popillia japonica*).

United States quarantined to protect Hawaii.—Quarantine No. 51: Regulates the movement from the United States to the Territory of Hawaii, as ships' stores or as baggage or effects of passengers or crews, of sugar cane, corn, cotton, alfalfa, and the fruits of the avocado and papaya.

Pink bollworm.—Quarantine No. 52, with revised rules and regulations: Prohibits the interstate movement from the infested and regulated areas of Texas, Louisiana, and New Mexico of cotton, including all parts of the plant, seed cotton, cotton lint, linters, gin waste, and all other forms of cotton lint, cotton seed, cottonseed hulls, cottonseed cake and meal, bagging and other containers of the articles enumerated, and also railway cars, boats, and other vehicles which have been used in conveying cotton and cotton products grown in the infested districts or which are fouled with such products, hay and other farm products, farm household goods, and farm equipment, except as provided in the rules and regulations supplemental thereto, on account of the pink bollworm of cotton (*Pectinophora gossypiella* Saunders).

Satin moth.—Quarantine No. 53: Prohibits the interstate movement to points outside of the infested areas in New Hampshire and Massachusetts of all species or varieties of poplar and willow, on account of the satin moth (*Stilpnotia salicis* L.).

White-pine blister rust.—Quarantine No. 54: Prohibits the interstate movement from all counties in the State of Washington lying west of the crest of the Cascade Mountains of five-leaved pines, currant and gooseberry plants, on account of the white-pine blister rust.

FOREIGN QUARANTINES.

Irish potatoes.—Quarantine No. 3: Prohibits the importation of the common or Irish potato from Newfoundland; the islands of St. Pierre and Miquelon; Great Britain, including England, Scotland, Wales, and Ireland; Germany; and Austria-Hungary, on account of the disease known as potato wart.

Mexican fruits.—Quarantine No. 5, as amended: Prohibits the importation of oranges, sweet limes, grapefruit, mangoes, achras sapotes, peaches, guavas, and plums from the Republic of Mexico, on account of the Mexican fruit fly.

Five-leaved pines, Ribes and Grossularia.—Quarantine No. 7, as amended: Prohibits the importation from each and every country of Europe and Asia, and from the Dominion of Canada and Newfoundland, of all five-leaved pines and all species and varieties of the genera *Ribes* and *Grossularia*, on account of the white-pine blister rust.

Cotton seed and cottonseed hulls.—Quarantine No. 8, as amended: Prohibits the importation from any foreign locality and country, excepting only the locality of the Imperial Valley, in the State of Lower California, Mexico, of cotton seed (including seed cotton) of all species and varieties, and cottonseed hulls, on account of the pink bollworm. Cotton and cotton seed from the Imperial Valley may be entered under permit and regulation.

Seeds of avocado or alligator pear.—Quarantine No. 12: Prohibits the importation from Mexico and the countries of Central America of the seeds of the avocado or alligator pear on account of the avocado weevil.

Sugar cane.—Quarantine No. 15: Prohibits the importation from all foreign countries of living canes of sugar cane, or cuttings or parts thereof, on account of certain injurious insects and fungous diseases. There are no restrictions on the entry of such materials into Hawaii and Porto Rico.

Citrus nursery stock.—Quarantine No. 19: Prohibits the importation from all foreign localities and countries of all citrus nursery stock, including buds, scions, and seeds, on account of the citrus canker and other dangerous citrus diseases. The term "citrus," as used in this quarantine, includes all plants belonging to the subfamily or tribe *Citratæ*.

European Pines.—Quarantine No. 20: Prohibits, on account of the European pine-shoot moth (*Evetria buoliana*), the importation from all European countries and localities of all pines not already excluded by Quarantine No. 7.

Indian corn or maize and related plants.—Quarantine No. 24, as amended: Prohibits the importation from southeastern Asia (including India, Siam, Indo-China, and China), Malayan Archipelago, Australia, New Zealand, Oceania, Philippine Islands,

Formosa, Japan, and adjacent islands, in the raw or unmanufactured state, of seed and all other portions of Indian corn or maize (*Zea mays L.*), and the closely related plants, including all species of Teosinte (*Euchlaena*), Job's tears (*Coix*), *Polytoca*, *Chionachne*, and *Sclerachne*, on account of the downy mildews and *Physoderma* diseases of Indian corn, except that Indian corn or maize may be imported under permit and upon compliance with the conditions prescribed in the regulations of the Secretary of Agriculture.

Citrus fruit.—Quarantine No. 28: Prohibits the importation from eastern and southeastern Asia (including India, Siam, Indo-China, and China), the Malayan Archipelago, the Philippine Islands, Oceania (except Australia, Tasmania, and New Zealand), Japan (including Formosa and other islands adjacent to Japan), and the Union of South Africa, of all species and varieties of citrus fruits, on account of the citrus canker, except that oranges of the mandarin class (including satsuma and tangerine varieties) may be imported under permit and upon compliance with the conditions prescribed in the regulations of the Secretary of Agriculture.

Sweet potato and yam.—Quarantine No. 29: Prohibits the importation for any purpose of any variety of sweet potatoes or yams (*Ipomoea batatas* and *Dioscorea* spp.) from all foreign countries and localities, on account of the sweet-potato weevils (*Cylas* spp.) and the sweet-potato scarabee (*Euscepes batatae*).

Banana plants.—Quarantine No. 31: Prohibits the importation for any purpose of any species or variety of banana plants (*Musa* spp.), or portions thereof, from all foreign countries and localities, on account of the banana-root borer (*Cosmopolites sordidus*). No restrictions are placed on the importation of the fruit of the banana.

Bamboo.—Quarantine No. 34: Prohibits the importation for any purpose of any variety of bamboo seed, plants, or cuttings thereof capable of propagation, including all genera and species of the tribe *Bambuseae*, from all foreign countries and localities, on account of dangerous plant diseases, including the bamboo smut (*Ustilago shiraiana*). This quarantine order does not apply to bamboo timber consisting of the mature dried culms or canes which are imported for fishing rods, furniture making, or other purposes, or to any kind of article manufactured from bamboo or to bamboo shoots cooked or otherwise preserved.

Nursery stock, plants, and seeds.—Quarantine No. 37, with regulations, revised: Prohibits the importation of nursery stock and other plants and seeds from all foreign countries and localities, on account of certain injurious insects and fungous diseases, except as provided in the regulations. Under this quarantine the following plants and plant products may be imported without restriction: Fruits, vegetables, cereals, and other plant products imported for medicinal, food, or manufacturing purposes and field, vegetable, and flower seeds. The entry of the following plants is permitted under permit: Lily bulbs, lily of the valley, narcissus, hyacinths, tulips, and crocus; stocks, cuttings, scions, and buds of fruits; rose stocks, including manetti, multiflora, brier rose, and rosa rugosa; nuts, including palm seeds, seeds of fruit, forest, ornamental, and shade trees; seeds of deciduous and evergreen ornamental shrubs, and seeds of hardy perennial plants.

Provision is also made for the issuance of special permits under safeguards to be prescribed in such permits for the entry in limited quantities of nursery stock and other plants and seeds not covered in the preceding lists for the purpose of keeping the country supplied with new varieties and necessary propagating stock.

Flag smut and take-all.—Quarantine No. 39, with regulations: Prohibits the importation of seed or paddy rice from Australia, India, Japan, Italy, France, Germany, Belgium, Great Britain, Ireland, and Brazil on account of two dangerous plant diseases known as flag smut (*Urocystis tritici*) and take-all (*Ophiobolus graminis*). Wheat, oats, barley, and rye may be imported from the countries named only under permit and upon compliance with the conditions prescribed in the regulations of the Secretary of Agriculture.

European corn borer.—Quarantine No. 41, with regulations, revised: Prohibits the importation of the stalk and all other parts, whether used for packing or other purposes, in the raw or unmanufactured state, of Indian corn or maize, broom corn, sweet sorghums, grain sorghums, Sudan grass, Johnson grass, sugar cane, pearl millet, napier grass, teosinte, and Job's tears, from all foreign countries and localities, except as provided in the rules and regulations supplemental thereto, on account of the European corn borer (*Pyrausta nubilalis*) and other dangerous insects and plant diseases.

Mexican corn.—Quarantine No. 42, with regulations: Prohibits the importation of Indian corn or maize from Mexico, except as provided in the rules and regulations supplemental thereto, on account of the contamination of such corn with cotton seed more or less infested with the pink bollworm.

Stocks, cuttings, scions, and buds of fruits.—Quarantine No. 44: Prohibits the importation of stocks, cuttings, scions, and buds of fruits from Asia, Japan, Philippine

Islands, and Oceania (including Australia and New Zealand) on account of dangerous plant diseases, including Japanese apple cankers, blister blight, and rusts, and injurious insect pests, including the oriental fruit moth, the pear fruit borer, the apple moth, etc.

Citrus black fly.—Quarantine No. 49, with regulations: Prohibits the importation of fruits and vegetables, and of plants or portions of plants used as packing material in connection with shipments of such fruits and vegetables, or otherwise, from Cuba, the Bahamas, Jamaica, Canal Zone, Costa Rica, India, Philippine Islands, Ceylon, and Java, except as provided in the rules and regulations supplemental thereto, on account of the citrus black fly (*Aleurocanthus woglumi*).

OTHER RESTRICTIVE ORDERS.

The regulation of the entry of nursery stock from foreign countries into the United States was specifically provided for in the plant quarantine act. The act further provides for the similar regulation of any other class of plants or plant products when the need therefor shall be determined. The entry of the plants and plant products listed below has been brought under such regulation:

Nursery stock.—The conditions governing the entry of nursery stock and other plants and seeds from all foreign countries and localities are indicated above under "Foreign quarantines." (See quarantine No. 37, revised.)

Irish potatoes.—The importation of Irish potatoes is prohibited altogether from the countries enumerated in the potato quarantine. Potatoes may be admitted from other foreign countries under permit and in accordance with the provisions of the regulations issued under order of December 22, 1913, bringing the entry of potatoes under restriction on account of injurious potato diseases and insect pests. Importation of potatoes is now authorized from the following countries: Denmark, Cuba, Bermuda, and the Dominion of Canada; also from the States of Chihuahua and Sonora, and the Imperial Valley in Lower California, Mexico. The regulations issued under this order have been amended so as to permit, free of any restrictions whatsoever under the plant quarantine act, the importation of potatoes from any foreign country into the Territories of Porto Rico and Hawaii for local use only and from the Dominion of Canada and Bermuda into the United States or any of its Territories or Districts.

Avocado, or alligator pear.—The order of February 27, 1914, prohibits the importation from Mexico and the countries of Central America of the fruits of the avocado, or alligator pear, except under permit and in accordance with the other provisions of the regulations issued under said order, on account of the avocado weevil. Entry is permitted through the port of New York only and is limited to the large, thick-skinned variety of the avocado. The importation of the small, purple, thin-skinned variety of the fruit of the avocado and of avocado nursery stock under 18 months of age, is prohibited.

Cotton.—The order of April 27, 1915, prohibits the importation of cotton from all foreign countries and localities, except under permit and in accordance with the other provisions of the regulations issued under said order, on account of injurious insects, including the pink bollworm. These regulations apply in part to cotton grown in and imported from the Imperial Valley, in the State of Lower California, Mexico.

Cottonseed products.—The order of June 23, 1917, prohibits the importation of cottonseed cake, meal, and all other cottonseed products, except oil, from all foreign countries, and a second order of June 23, 1917, prohibits the importation of cottonseed oil from Mexico, except under permit and in accordance with the other provisions of the regulations issued under said orders, on account of injurious insects, including the pink bollworm.



